ARTICLES

Does the Endangered Xenarthran Fauna of Amazonia Include Remnant Ground Sloths?

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In what was viewed by many as an extremely controversial paper (Oren, 1993), I proposed that stories linked to an Amazonian creature known locally as the *mapinguari* or *juma*, among other names, may be based on human contact with remnant ground sloths. In general, it is considered that all the ground sloths are extinct and that there are only two living genera of tree-sloths (*Choloepus* and *Bradypus*), highly adapted to an arboreal lifestyle. I myself was among those sharing this general viewpoint, until I met Amazonians who told me about supposed face-to-face encounters with an animal that is best interpreted as a living remnant ground sloth. Seven claimed to have actually killed specimens. Even if there is only a small possibility that these stories are based on fact, it seems worthwhile from a conservation point of view to entertain, at least for the sake of argument, the possibility that there is an additional form of endangered xenarthran, however unlikely, in the forests of Amazonia. I further argue that such a remanescent form is really not all that unexpected.

The living and extinct sloths are generally divided into four or five families (some authors merge Mylodontidae and Scelidotheridae) (see McKenna and Bell 1997). My article was not the first time that someone had proposed that there might still be ground sloths alive in South America. More than 100 years ago, Argentine paleontologist Florentino Ameghino created a great international stir by proposing that mylodontid ground sloths were still extant in Patagonia (Ameghino 1898, 1899). He had two lines of evidence. First, his friend Ramón Lista, an Argentine geographer and government official, reported sighting a strange quadruped in Santa Cruz, southern Patagonia. He said that it was pangolin-like but hairy. Lista said that he and his companions shot at the animal but that it escaped into the vegetation, apparently unscathed. Later Ameghino examined what to him appeared to be a piece of fresh ground sloth skin, which we now know originated from a mummified mylodontid discovered in a cave at Ultima Esperanza Bay in Chile. Based on the skin fragment, Ameghino then described *Neomylodon listae* in honor of his friend. Radio-carbon and stratigraphic evidence gives ages ranging from 5,000 to 13,000 years for the ground sloth remains from the Ultima Esperanza Bay cave, and 4,400 years for a sloth bone from northern Chile, but there is controversy about these dates, which are not universally accepted (Greenwell, 1996).

In the Caribbean there is a good possibility that relatively small megalonychid ground sloths and humans coexisted. The probably semi-arboreal *Synocnus* of Hispaniola is the best candidate for having overlapped with human occupation in the West Indies. Other megalonychid genera possibly co-occurring with paleo-Indians include *Acratocnus* of Cuba and Puerto Rico and *Parocnus* of Cuba and Hispaniola (McKenna and Bell, 1997).

Bernard Heuvelmans (1958), the consolidator of cryptozoology, retells the story of Ameghino and colleagues in his classic tome, and ends his fascinating chapter on ground sloths in Patagonia with the following on the possibility that there still might be ground sloths somewhere:

"...the largest sloths would have retreated, as the jaguar did, to the tropical forests, where they could find a safer refuge. All the same, it is unlikely that the really gigantic species could have adapted themselves to the inextricable virgin forests, the habitat in which the small tree species flourished. If such is the case, what has happened to them in their impenetrable retreat in the vast Amazonian selva and the boscosa of the Andes? It is hard to see what, in the peace of these forests rarely inhabited by man, could have led

to their extinction. Might they not still live in this "green hell" and find it a heaven of peace?"

Curiously enough, Heuvelmans' next chapter is precisely on would-be unknown species of the Amazon, but there is no further mention of ground sloths. In this chapter, he attributes all stories of *mapinguaris* and similar creatures to undescribed primates.

Ever since I first arrived in the Brazilian Amazon in 1977, I heard tales of all sorts of mythical creatures in the rainforest. There is the *curupira*, a small, childlike imp that has its feet turned backwards and rides on the backs of white-lipped peccaries. Forest dwellers who overhunt are certain to be enchanted by the *curupira*, who will get them hopelessly lost in the *selva*. The *mãe-de-seringa* is the protector of the rubber trees, and those who tap latex in a form that is harmful to the trees will be attacked by this vampire-like woman, who kills her victims.

From my first field work in the Tapajós River basin, I heard stories of the *mapinguari*, a fearsome, powerful, hairy, stinking behemoth with a blood-curdling roar and human-like proportions. Surely this creature also was part of the panoply of mythical animals that the natives love to talk about. But the more I traveled to other basins, the more stories I heard, until finally in 1988 I heard an account that I could not dismiss as a fictional tale of a run-in with a myth. Clearly my interlocutor was not lying about what he claimed to have seen in the forests of what today is northern Tocantins State. After listening carefully to the story, a light went on in my brain: "This creature could only be a ground sloth!" Then a more cautionary tone took over: "Wait a minute, you'll be taken for a wacko!"

Family	Representatives
Mylodontidae	Extinct Ground Sloths, North and South America
Scelidotheridae	Extinct Ground Sloths, South America
Megatheriidae	Extinct Ground Sloths, North, Central and South America
Megalonychidae	Extinct Ground Sloths, Choloepus (Two-toed Sloths), North, Central and South America, plus West Indies
Bradypodidae	Three-toed Sloths (Bradypus), Central and South America

When I wrote the 1993 paper, I had never interviewed anyone who had claimed to have killed one of these supposed animals. I now have testimony from seven hunters who say they killed these animals in the following municipalities in the Brazilian Amazon: Eirunepé (Amazonas), Marabá (Pará), region of the Parque Nacional da Serra do Divisor (Acre – two hunters), Juína (Mato Grosso), Manicoré (Amazonas), and Carauarí (Amazonas). Supposed witnesses who say they simply came face to face with such an animal number over 80. What they describe: a creature approximately 2 m tall when standing upright; a very strong, unpleasant smell (most say that it's just the worst odor they ever smelled, although others describe the stench as a mixture of feces with rotting flesh); extremely heavy and powerful build; capable of breaking thick roots with its footsteps; claws on the manus similar in size to *Priodontes maximus* (Giant Armadillo), but shaped like those of *Myrmecophaga tridactyla* (Giant Anteater or Tamandua); long coarse fur that is either reddish, blackish or brownish in color; a muzzle that looks like a burro's or horse's, though shorter; four large canine-like teeth; ability to locomote on all fours and bipedally, although the bipedal gait is not agile; footprints that are roundish (quadrupedal gait) or like people's, but with only four toes (bipedal gait); and extremely loud, roaring vocalizations and/or vocalizations similar to a human calling loudly, but with a growl at the end. Six of the hunters claimed that they killed the animal with special slugs of solid lead in shotguns aimed at the head, and that normal shot aimed elsewhere has little effect on the animal. The seventh hunter emptied a 38 caliber revolver into the animal's chest. Three hunters saved remains (samples of hair, claws or a manus), which were later discarded, while the others saved nothing. They stated that they did not save remains principally due to the insupportable odor the animal emitted, which left them light-headed and nauseous.

Although in the 1993 paper I proposed that if such an animal is a ground sloth then it probably belongs to the Mylodontidae, my suggestion now is that a megalonychid is a better candidate, based primarily on the four canine-like teeth and gait. Only megalonychids could have locomoted the way witnesses describe (as per Toledo, 1998).

I admit that not all the evidence is consistent with a ground sloth. The hunters claim that the animal had a short tail. In all cases for which we have reasonably complete material, the known fossil ground sloths had well-developed tails, important for stability when used to complete a "tripod" with the lower limbs to reach up to browse on foliage. Some researchers have suggested that the descriptions they have heard in the Amazon of such an animal are more consistent with a bear than a ground sloth (K. Campbell, pers. com., J. Patton, pers. comm.). In this context it is important to note that Shepard (in press), found that the Peruvian Matsigenka tribe describe an animal of which they are terrified, called *segamai*, very similar to the Brazilian Amazonian *mapinguari*. When asked if it is like a bear (they know Andean bears well), they expressed great surprise and affirmed that the two animals are completely different (Shepard, pers. comm.).

Castor Cartelle (pers. comm.) questions the loud vocalizations, since living sloths and other xenarthrans are largely mute. Although the modern xenarthrans pass most of their time quietly, they are indeed capable of making impressive sounds, such as the weeping-like vocalizations of *Bradypus* (pers. obs.), trumpet-like vocalizations produced by *Priodontes* (pers. obs.), and variety of sounds made by three tamanduas and an armadillo available on Emmons *et al*'s (1997) CD of Neotropical mammal sounds.

I am the first to confess that this adventure into cryptozoology is a dangerous one for a researcher concerned with maintaining his reputation as an authority on Amazonian biodiversity. At the same time, I believe that just coming forward with this hypothesis increases by several orders of magnitude the chances that if an animal of this sort is killed, at least part of it will make it into the hands of someone who recognizes its importance. And can one imagine the boon to conservation in tropical South America if such a spectacular new "flagship" species were to be found? At the very least there would be better funding for basic biological inventory work. This is not a search for dinosaurs, extinct tens of millions of years, but the possibility of a very rare, remnant representative of a fauna that flourished in the Americas, and particularly in Amazonia (Ranzi, 2000), until a few thousand years ago. The Chacoan Peccary was discovered still living only 27 years ago, Javan rhinos were recently rediscovered on the Asian mainland, and two new ungulates were recently described from war-torn Vietnam. In the vastness of the Amazon, the discovery of a large new mammal cannot be considered all that unlikely or improbable.

As a side note, Richard Cerutti (pers. comm.), paleontologist at the San Diego Natural History Museum, suggested to me that descriptions of the legendary "Bigfoot" or "Sasquatch" of the Pacific Northwest of the United States and Canadá are much more consistent with a remnant ground sloth than with some undescribed great ape. There were plenty of ground sloths in that region until quite recently, and no great ape fossils have ever been found there. He did not by any means try to suggest that such an animal is still living, but rather that folklore tradition of the native peoples there has maintained the animal "alive," even though it probably went extinct hundreds or even thousands of years ago. Is such the case with the *mapinguari*, alive in folklore but long gone in nature? If so, what did those seven hunters kill deep in the Amazon rainforest?

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Armadillos del Noroeste Argentino (Provincias de Jujuy y Salta)

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Abstract

Data on the presence of species, abundance and habitat association of armadillos from northwestern Argentina were collected during two field seasons in 1988. Four of the eight previously cited species were recorded. Among them, *Tolypeutes matacus* showed a well-defined association with xeric habitats, *Dasypus yepesi* and *Euphractus sexcinctus* were present from the xeric lowland environments to humid mountain forests. *Chaetophractus vellerosus*, although typical in dry environments, was recorded in the same habitats as *D. yepesi* and *E. sexcinctus* but was very scarce.

Introdución

Los estudios sobre la asociación de los armadillos con el ambiente que habitan son pocos y aislados y, si bien se cuenta con cierta cantidad de información acerca de sus distribuciones geográficas, poco es lo que se sabe respecto de sus exigencias ecológicas. En este sentido, el noroeste argentino es una región interesante pues en un área relativamente pequeña se da la conjunción de tres dominios biogeográficos representados por una gran variedad de hábitats y de zonas ecotonales (Cabrera y Willink, 1973). Esta condición de variedad ambiental se halla determinada en gran parte por la topografía regional, con un relieve montañoso de pendientes pronunciadas que determina marcadas variaciones altitudinales de temperatura, presión, humedad y precipitaciones. Las lluvias dependen además de la orientación de las laderas con respecto a los vientos dominantes del este, de modo que las laderas orientales reciben fuertes lluvias estivales a medida que el viento gana altura y se enfría, mientras que las cumbres más altas y las laderas occidentales reciben vientos secos que han perdido su humedad durante el ascenso por el lado oriental.

Durante los meses de junio y noviembre de 1988 se realizaron trabajos de campo en la región, en los que se recorrió una extensa zona de los departamentos de Ledesma, Valle Grande y Santa Bárbara (Provincia de Jujuy) y Orán (Provincia de Salta), visitando numerosas localidades ubicadas a diferentes altitudes y en distintas unidades de hábitat. También, se efectuó una transecta de aproximadamente 150 kilómetros entre las localidades de Humahuaca (Departamento Humahuaca, Jujuy, 3000 msnm) y San Ramón de la Nueva Orán (Departamento de Orán, Salta, 500 msnm),